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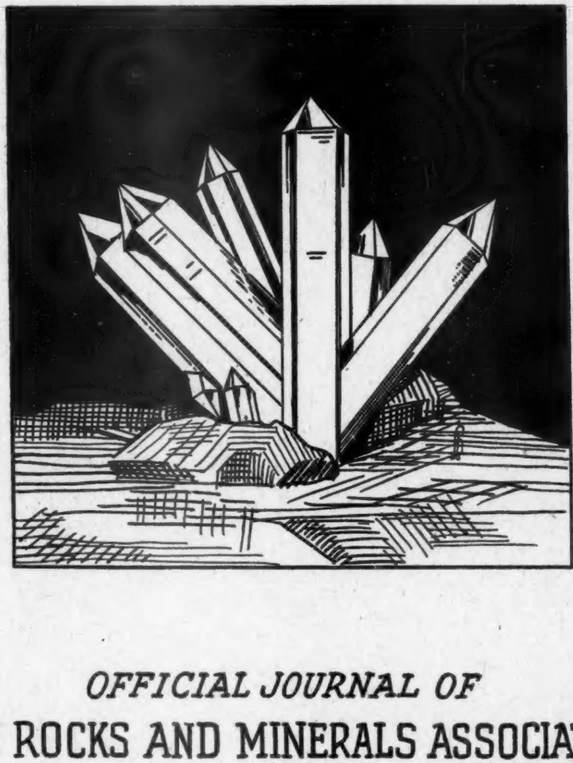
ROCKS AND MINERALS

A MAGAZINE FOR MINERALOGIST, GEOLOGIST & COLLECTOR



OFFICIAL JOURNAL OF

THE ROCKS AND MINERALS ASSOCIATION

NRA MEMBER U.S. WE DO OUR PART

PUBLISHED MONTHLY MARCH 1934

THE BULLETIN BOARD

Rocks and Minerals Club Organized in Chicago

The Chicago Chapter of the Rocks and Minerals Association was inaugmented with a "get-acquainted" dinner on February 17, 1934, at which over forty per cent of those notified of the meeting were present, making a total attendance of thirty-five. With such an encouraging turn-out for the initial meeting, the Chicago Chapter is looking forward to a long series of well-attended gatherings.

The members met at four o'cock at the Museum of Science and Industry, where they studied the many exhibits on geology.

At 6:15 the group adjourned to the Broadview Hotel for dinner. The Chairman briefly discussed the purpose for organizing the Club and outlined some of the various activities to which the attention of the members might be directed. This was followed by an informal discussion on "Collecting Rocks and Minerals around Chicago," by Dr. D. Jerome Fisher, Professor of Mineralogy at The University of Chicago. Dr. Fisher's choice was a most suitable one for the first meeting. He went into the fundamental reasons for desiring to collect anything at all—from match box covers to Ming vases—and showed that a collection of natural objects, such as rocks and minerals, is a more satisfying hobby than a collection of artifacts. After this brief introduction he went on to describe the possibilities of the Chicago area as a collecting ground for rocks and minerals. The "finds" of this region may be divided into two groups, rocks and minerals formed on the spot and those formed elsewhere and transported to their present resting place, either by Nature of by man. Most of Chicago's rocks and minerals are of the second type, and Dr. Fisher described and showed specimens of some of the minerals to be looked for. He then listed the important equipment needed for obtaining good specimens and briefly described the technique of field work. He listed the quarries, clay pits, and beaches most favorable for collecting specimens **in situ** and transported specimens as well. In closing Dr. Fisher brought out the often overlooked fact that a metropolitan collector can find in the building stones of large cities a rich and varied field of study.

Mr. F. L. Fleener, Professor of Geology at the Joliet Township Junior College, followed Dr. Fisher on the program relating some of his experiences in the Wilmington strip coal mines. This is a famous collecting ground for concretions and nodules which, when carefully cracked open, reveal their fascinating secrets—fossils of life in the ancient coal swamps. Mr. Fleener brought with him some very fine specimens from this locality.

After a period of open discussion on the two addresses, Mr. Ben Hur Wilson, National Director of Program Building and Research, presented each member of the group with a complimentary copy of ROCK and MINERALS, explaining the significance and purpose of the Rocks and Minerals Association. He also suggested that the interest in this instructive and enjoyable hobby might spread through the members of the adult group to the young people of the community and result in the formation of a number of junior clubs.

With Mr. Wilson's message the Chicago Chapter closed what we hope will be the first of many group activities in the interest of nature study as a hobby.

Executive Committee—G. Frederick Shepherd, Chairman; August Rassweiler, S. N. Green, J. H. Brown.

N. B.—Persons in the region of greater Chicago, who are interested in this activity and who would like to be notified of coming meetings and field trips, are asked to communicate with the Chairman, whose address is: Museum of Science and Industry, 57th Street and Lake Michigan, Chicago.

ROCKS and MINERALS

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The Official Journal *of the* Rocks and Minerals Association

MARCH 1934

VOL. 9, No. 3

WHOLE No. 33

SAND

By JAMES H. C. MARTENS,
West Virginia University

Although sand is a very common substance, probably few people realize how much it may vary in appearance and composition, or have any idea of its numerous uses or the many ways in which it is formed or deposited.

We may define sand as a natural granular substance, composed of mineral or rock particles, which are not bound or cemented together to form a solid rock. The usual limits on the size of grains or particles in sand are from 1/500 to 1/4 inch. Material coarser than this is pebbles or gravel, while material finer is clay or silt. This definition does not specify anything as to the composition of the grains, but in the ordinary varieties the grains are composed mostly of the mineral quartz, which is silicon dioxide.

The renowned Swedish scientist, Carl von Linné, had the peculiar idea that sand and related siliceous materials originated from rain drops which have grown together and solidified. Johann Friedrich Gmelin, the translator into German of Linné's work on the mineral kingdom, recognized in an edition of it published in Nürnberg in 1777, that the difference in composition of water and quartz made this an impossibility.

The grains of which sand is composed have been formed by the natural breaking up or disintergation of some hard rock which existed previously. The usual process of breaking up of rock masses exposed at the surface of the earth is called weathering, since it is caused by the action of the weather. This includes effects of frost, changes of temperature, rain water, and the direct chemical action of the gases in the atmosphere. By prolonged exposure to the weather the softer and less resistant minerals are dissolved or converted into clay, while the harder and more insoluble ones remain as pebbles or sand.

The soil resulting from rock weathering is likely to be eventually blown away by the wind or washed away by running water. Most of the various kinds of sand deposits are formed as the grains are dropped by the wind or settle out from the water. The sand grains have usually not been formed where we now find them, but rather derived from some other rock which may be hundreds of miles away. In this natural process of transportation and deposition most of the coarser and finer materials are sorted out from the sand.

Under certain conditions, for example, those existing in very cold or arid regions, a hard rock may be broken down into sand with very little chemical change. Sand grains may also be formed by the grinding action of glacial ice on underlying rocks. Volcanic sand is fragmental material of medium coarseness, thrown out in explosive eruptions of volcanoes. Sands formed in these ways are likely to differ greatly in composition from those resulting from the chemical weathering of rocks. Some sands along the seashore, especially in warm countries, are composed mostly of shells and coral fragments, and are therefore composed chiefly of calcium carbonate rather than silica.

Even in sands which contain a high percentage of quartz, numerous other

minerals are usually present in small quantity. Most of these are rather easily seen and recognized under the microscope, but except in coarse sands it may be impossible to distinguish them with the unaided eye. Fifteen or twenty minerals are often present in a single handful of sand, and exceptionally twice that many.

A person who has not made a special study of sand might suppose that one sand grain would be about like another, but when we consider that several varieties of the same mineral may be present, and that there is usually a wide range in sizes and shapes of the grains of each mineral, it becomes apparent that a large number of grains may be examined without finding two which are exactly alike. The shapes of sand grains may be observed with any kind of microscope of low magnifying power, or directly by the unaided eye if the sand is coarse. Some of the harder and more insoluble minerals may be found in perfect crystals, which have resisted for a long time the solvent action of water and the shocks of one grain hitting another as they are carried by a stream of water or tossed about by the waves on the beach. The larger grains are more likely to have their corners and edges rounded off. Rarely we find grains of quartz and other hard minerals which have been rounded to almost perfect spheres. Frequently a rather large proportion of the grains are irregular in shape and have sharp edges, somewhat resembling chips of broken glass.

Both the composition of a sand and the shapes of the grains are closely related to its origin. Since sands are composed mostly of particles derived from other rocks, both the nature of these rocks and the processes by which they have been broken up and the sand grains moved and deposited, are important in determining the characteristics of the sand.

Of course the color of a sand is very closely related to its composition. A pure quartz sand is white. Excellent examples of such sand may be found on the shore of the Gulf of Mexico in northwestern Florida, where the sand of the dunes and beaches is as white as freshly fallen snow. In fact, it is so white that a professional photographer goes there to take photographs of "snow scenes" to be used on Christmas cards.

More commonly sand is gray, yellow, or brown. The gray color may be due to dark shale particles or to partly decayed parts of plants, or other organic material. Scattered grains of black minerals may also cause grayness.

Yellow and brown sands are very common. Their coloration is due to a coating of iron oxide on the outside of the sand grains, this coating being practically the same thing as iron rust. A red sand occurring extensively in the southern states is colored by iron oxide in a slightly different form. Sand which is green in color is common in some parts of the country, for example, Maryland, New Jersey and Texas. This is known as greensand, and contains the mineral glauconite, which has been formed on the bottom of the sea. It is much different in composition from ordinary sand, and has been considered as a possible source of potash for use in fertilizer.

Black sand frequently occurs on the shores of lakes and ocean where the action of the waves on the beach has caused a separation or concentration of the heavier and darker minerals which were originally scattered through a much greater amount of quartz sand. Red sands composed mostly of garnet have a similar origin. They generally make up only a small part of the beach on which they occur. Garnet sands are found in eastern Canada, on Long Island, New York, in California, and in Ceylon.

Sand deposits are formed in many different ways and in a variety of places. Probably most of the readers of this magazine have noticed that sand is abundant along many rivers and creeks. It has been carried there by running water, and, at least during some part of the year, it is being carried still farther downstream. From such deposits in the medium sized to large rivers, sand is obtained by dredging. Where the current is very swift as in mountain streams, the sand has been carried away, and only the heavier pebbles and boulders are left. Great quantities of sand are deposited where a river with a strong current empties into a more quiet body of water.

Sand occurs extensively on the coasts of the ocean and large lakes, especially where land is low. The sand forms beaches and dunes along the shore and frequently extends a long distance out

as a deposit on the bottom. The largest areas of sandy land in the United States are found in the region known as the Coastal Plain, which makes up the low, and in great part, comparatively flat, area extending from southern New England, through Long Island, New York, along the Atlantic coast to Florida. It includes all of Florida, and extends from there as a broad strip around the Gulf coast to and across Texas. The sandy formations of this region were deposited partly beneath the sea when the land stood at a lower elevation relative to the sea than at present, and partly by the rivers which carry much sand from the higher land in the interior.

It is well known that sand which has been blown by the wind occurs extensively in desert regions, although it is far from being true that deserts are always sandy. More of them have a bare rock or gravel surface from which all of the sand has been blown away.

In the peak years of 1928 and 1929 the annual production of sand in the United States was about 100,000,000 tons. This does not include much sand used for such purposes as grading, and filling low ground, or much that was dug by small producers for local use. The only mineral products of the United States for which the tonnage equals or exceeds that of sand are coal, petroleum, gravel, and total crushed stone of all kinds.

There are so many uses of sand that it will be possible to mention only a few of them. For some of these uses the sand must comply so exactly with certain specifications that suitable material can be found in only a few places, while for other uses the requirements are not so strict, and local sources of sand can often supply the needs. The principal things to be considered in selecting sands for special uses are the size of grains, the presence or absence of organic matter, and the amount of clay. For some uses the chemical or mineral composition is also important.

The greatest single use of sand is in building, where it forms a large and essential part of concrete, brick mortar, stone masonry mortar, wall plaster and stucco. The next most important use is in highway construction. Here the sand is used in several different ways, —as concrete aggregate, in asphalt pavements, for the base on which brick pavement is laid, and for sand-clay roads. Molding sand is used by the foundry industry for the molds in which metal castings are poured. Sand for this purpose contains a certain amount of clay which helps to bind it together, besides having other special properties.

In glass manufacture sand which is very pure chemically is required. The percentage of silica must be very high, and the percentage of iron very low.

Other uses of sand are for grinding and polishing, for water filtration, sand-lime brick manufacture, and in the chemical and ceramic industries.

Sand forms the principal part of many soils. Some soils which are nearly pure quartz sand are fairly productive, or even very highly productive when there is abundant rainfall and plenty of fertilizer is applied. A large part of the citrus fruits grown in Florida are raised on such sandy soils.

Another instance of practical importance of sand, although it does not involve any actual use of the sand itself, is the occurrence of most natural gas and oil in sand and sandstone. This is because the pore space between the sand grains provide a better place for the accumulation of the oil and gas than there is likely to be in other rocks. In fact this relation is so general, and the exceptions so few, that people interested in oil and gas production practically always call the productive rock "oil sand" or "gas sand," although in a few places it is some other kind of rock.

A society for precious stone research has recently been organized in Germany by George O. Wind and a group of scientists. One project in view is the publication of a scientific magazine on gems but written in a popular manner so as to appeal to the average individual.

GNOMES and KOBOLDS

Guardian Spirits of Medieval Mines and Minerals*

By

E. MITCHELL GUNNELL

Most of us can recall our childhood impressions of the gnomes and goblins we read of in the fairy tales by Anderson and the brothers Grimm, but how many of us know the legendary origin of these bearded little old men of the mountains and of their part in the interesting story of medieval mining? It is the purpose of this article to picture the gnome in his true colors, and to offer a logical explanation for the old belief in his existence.

The idea of elemental spirits, that is intelligences inhabiting the four elements air, earth, fire, and water, probably had its origin in classical mythology. Whether or not this is true, the idea was reintroduced and taught by Paracelsus[1] in the sixteenth century. This famous alchemist and physician of the Middle Ages first definitely systematized the pneumatology of these times. During those centuries of intellectual stagnation, superstitution literally ran riot, and many and sometimes terrible were the beings created by the human imagination.

The elemental spirits which inhabited the air, and were supposedly composed of the finest essence of it, were known as sylphs; those living in the earth were called gnomes or pygmies; those with fire as their abode were the salamanders; and those whose element was water were the nymphs or undines. All these intelligences were, as Paracelsus himself stated, "beings occupying a place midway between men and spirits (as God and the angels), resembling men and women in their organization and form, and spirits in the rapidity of their locomotion."[2] While of longer life than humans, they did not possess a soul, and thus were not immortal. Their costumes, actions and speech, reproduction, habits, and form were not unlike those of humans. The elemental spirits inhabited only their own particular elements; thus, stated Paracelsus, "the element of the gnomes is the earth, and they pass through rocks and walls and stones like a thought, for such things are to them no greater obstacles than the air to us."[3] All the elemental spirits were by nature invisible, but they could and did appear to men for whom they had conceived a liking. To these persons they were kindly disposed, even to yielding to the secrets of their particular domain.

Paracelsus mentions another type of earth-spirit besides the gnomes. These were the dwarfs, and they were related to the elemental spirits in the sense of monsters. The dwarfs were often the guardians of hidden treasures of precious minerals and metals and were sometimes seen and heard by the miners working underground. Being modeled after men who, in medieval cosmology, were higher beings, the gnomes and dwarfs were capable of liking or of disliking a man according to his character. They were worshipful of true learning and were ever friendly and helpful to the sage and scientist, the unofficious and sincere student. To those of a conceited, gluttonous, or vulgar nature, on the other hand, the earth-spirits were maliciously disposed.

An old source-book of legend[4] contains the following account of the origin of the dwarfs: "God gave the

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*Anthropologists incline to the idea that the folk-tales of elves and goblins—as well as those of fairies—preserve the tradition of a race of dwarfs that in prehistoric times inhabited northern and western Europe. As successive invasions of the fiercer eastern people drove them from the richer agricultural areas to the inhospitable mountainous regions they took up their dwellings in caves, grottoes, and like places far from the habitations of their conquerors. Thus they came in contact with the ruling races only occasionally, and then probably within or near their caverns. Hence the growth of a folk-lore regarding "the little peoples" which in later times lost its identity with actual living beings. Hardest fact to reconcile with this theory is the lack of concrete remains of such a dwarf race.

1. Phillippus Aureolus Theophrastus Paracelsus Bombastus von Hohenheim (1493-1541) was doubtless one of the great minds of the 16th century. Although tainted by the delusion of alchemy and the charlatanry of magic, Paracelsus was highly gifted in the art of healing, and he was the first to definitely discard the binding fetters of the Galen-Hippocrates school of medicine.

2. Hartmann, Franz, The Life of Paracelsus and the Substance of His Teachings. Chapter V, page 120, London, n. d.
3. Ibid., page 121.
4. The Heldenbuch, or "hero-book", preface.

dwarfs being, because the land and the mountains were altogether waste and uncultivated, and there was much store of silver and gold, and precious stones and pearls still in the mountains. Wherefore God made the dwarfs very artful and wise, that they might know good and evil right well, and for what everything was good. They knew also for what stones were good. Some stones give great strength; some make those who carry them about them invisible, that is called a mist-cloke; and therefore did God give the dwarfs skill and wisdom." This account is of interest because of its naive simplicity, and because it well illustrates the type of logic employed in bygone ages to justify what basicly was only a superstitious idea.

The "kobold" of Teutonic folk-lore was a mountain spirit similar in character and attributes to the gnomes and dwarfs. It is true that certain well-known kobolds, as for examples Hinzelmann[5] and Hutchen[6], were primarily house-spirits as they are portrayed in the legends but originally the kobold was a guardian spirit of mines and metals. Sir Walter Scott in a lesser known work thus describes the kobold: "They were a species of gnomes, who haunted the dark and solitary places, and were often seen in the mines, where they seemed to imitate the labors of the miners, and sometimes took pleasure in frustrating their objects, and rendering their toil unfruitful. Sometimes they were malignant, especially if neglected or insulted; but sometimes also they were indulgent to individuals they took under their protection. When a miner, therefore, hit upon a rich vein of ore, the inference commonly was, not that he possessed more skill, industry, or even luck than his fellow-workmen, but that the spirits of the mine had directed him to the treasure."[7]

The name "cobalt," applied to that now very useful iron-white metal, is undoubtedly derived from the word kobold. The reason for naming this metal for the kobolds makes an interesting story, and one that well illustrates the sometimes spiteful nature of these earth-spirits. In the early days of silver mining in the Ore Mountains (Erzgebirge) of southern Saxony, miners working near the towns of Annaberg and Schwarzenberg opened up veins of the silver-white mineral now called smaltite. Thinking that this material was silver or else a very rich ore of the metal they were seeking, the miners laboriously extracted quantities of it. But when subjected to the crude metallurgical processes of medieval times, this substance naturally yielded no silver, nor any other metal in fact—nothing but dense white clouds of vile-smelling vapor. The effect of such a failure on the superstitious miners is not hard to imagine. They immediately concluded that this must be the work of the mischievous kobolds who had spirited away all the silver ores during the night and substituted these deceptive but worthless substances. Since the miners held the kobolds responsible for the discovery of rich veins of silver by one of their number, how much more emphatically they would blame these dwarfs for the occurrence of metallic minerals the nature of which they were unacquainted. Thus in time such ores came to be known as "kobold's erz" and were thus inclusively designated until 1735 when a new metal was finally produced from them. This new metal was quite naturally given the name cobalt to immortalize those beings through whose machinations it was first brought to the attention of man.

The fairy mythology of many lands pictures counterparts of the German gnome, dwarf, and kobold. The English "elf," like the kobold, inhabited mountain caverns. The "hobgoblin," or simply "goblin," is made out in some tales to be very similar to the kobold, although most of his appearances were primarily in the role of a house-spirit. Keightley states that "the fairies of England are the dwarfs of Germany and the North,"[8] thus frankly admitting the impossibility of differentiating greatly between any of these beings. The "brownie" of Scotland, so well known to children through the cartoons by Palmer Cox, was a domestic spirit related to the hobgoblin. The "brown dwarf" of the Island of Rugen in the Baltic Sea appears to have worn the costume characteristic of all earth-beings. This costume is described by Keightley as follows, "They wear little

5. Keightley, Thomas, The Fairy Mythology. Bohn's Library edition, 1850. The Story of Hinzelmann, pp. 240-254.
6. Ibid., pp. 255-256.
7. Scott, Walter, Letters on Demonology and Witchcraft. Letter IV., page 110. New York, 1831.
8. Keightley, T., op. cit., page 281.

brown coats and jackets, and a brown cap (of invisibility) on their heads, with a little silver bell on it. Some of them wear black shoes with red strings in them."[9] Sometimes the brown jacket is exchanged for a red one with large buttons down the front of it. The elves or "huldrafolk" of the Norwegians are the Scandinavian version of the Teutonic gnome. The "gobelin" of Normandy is very similar to the English goblin. The "leprechaun" of Ireland and the "knocker" of Cornwall are both closely related to the kobold.

This last named being deserves more than passing mention. The Cornish knockers were small imps inhabiting the tin mines, whose pick sounds were often heard by the miners coming from unworked levels. Since the knockers generally avoided unproductive rock, their regularly repeated blows were regarded as indicating the location of rich ore. Wirt Sikes describes them thusly, "The word 'coblyn' has the double meaning of knocker or thumper and sprite or fiend. It is applied by Welsh miners to pigmy fairies which dwell in the mines, and point out, by peculiar rapping, rich veins of ore. . . . The coblynau are described as being about half a yard in height and very ugly to look upon, but extremely good-natured, and warm friends of the miner. Their dress is a grotesque imitation of the miner's garb, and they carry tiny hammers, picks and lamps. They work busily, loading ore in buckets, flitting about the shafts, turning tiny windlasses and pounding away like madmen but really accomplishing nothing whatever."[10]

Because of their isolation and wild scenery, the Harz Mountains of north central Germany were long regarded as haunted by witches, werewolves, and demons, and many strange legends are still told of its dark gorges, deep silent forests, and lonely heights. This atmosphere of the occult that overhangs the Harz so inspired Goethe that he laid the famous "Walpurgisnacht" scene in "Faust" on its highest summit, the Broken. The "bergmonch," or mountain monk, figures prominently in several legends of the old Harz mining districts. The Monchsthal or Monk's Valley, near Clausthal, was believed to be his favorite retreat. In nearby St. Andreasberg there is a tradition that he was a miner who attempted to reopen the old Samson mine but failed because of bankruptcy.[11] The bergmonch was always seen in the guise of a masterminer, and always carried a silver minelamp in his hand. Tales are told of his kindness to the miners in times of trouble and famine, as well as his characteristic severity towards evil-doers.

How are we to explain the origin of these various but closely related fairy beings? Since the belief in these spirits is a superstition that had its birth in the remote past, the best explanation possible is one that takes due account of the kind of thinking people did in olden times. Where an exact knowledge of physical causes for natural phenomena was lacking, such phenomena was explained by primitive people as the work of gods and spirits, or devils and demons, depending upon a good or an evil effect. This is the idea of animism, and it held sway over human minds until the triumph of the modern scientific method. Wirt Sikes offers these following animistic explanation for the belief in goblins and similar spirits, "It can hardly be cause for wonder that the miner should be superstitious. His life is passed in a dark and gloomy region, fathoms below the earth's green surface, surrounded by walls on which the dim lamps shed a fitful light. It is not surprising that imagination should conjure up the faces and forms of gnomes and coblynau, of phantoms and fairy men. When they hear the mysterious thumping which they know is not produced by any human being, and when in examining the place where the noise was heard they find there are really indications of ore, the sturdiest incredulity must sometimes be shaken. Science points out that the noise may be produced by the action of water upon the loose stones in fissures and pot-holes of the mountain limestone, and does actually suggest the presence of metals."[12] This is sound reasoning, emphasizing, as it does, the effect of a dark and myster-

(Continued on Page 35)

9. Keightley, T. op. cit., page 173.
10. Sikes, Wirt, British Goblins. Chapter II, page 24, Boston, 1881.
11. Lauder, Toofie, Legends and Tales of the Harz Mountains. Page 217. London, 1881.
12. Sikes, W., op. cit., page 26.

Graptolites From Alabama

By R. S. POOR, Ph.D.

Head, Department of Geology, Birmingham-Southern College, Birmingham, Ala.

Three or four years ago during the process of opening a new road from Calera, Alabama, to Montevallo, a cut was opened at a point about two miles west of Calera. The exposure shows the Athens shale of Ordovician age overlain by a few feet of Frog Mountain sandstone which has been assigned to the Devonian.

While collecting from this cut not long after it had been opened, Mr. V. M. Foster, and a group of students brought back to the laboratory several slabs which contained large numbers of rather unusually well preserved graptolites most of which were Climacograptus. There were other specimens, including Dicellograptus and Nemagraptus.

These ancient and extinct hybroids are extremely common in the Athens shale in almost every exposure of it in this state. However, only occasionally does one find them so fresh and well preserved as at this locality. One specimen of a colony found by one of the students attracted particular attention since its appearance was extremely coarser and its size much larger than any of the other forms. Since we were unable to make a generic identification the specimen was forwarded to Dr. Rudolf Ruedemann, a specialist on these organisms, at New York State Museum. Dr. Ruedemann was especially pleased to see the specimen; it proved to be a new species of the known genus, Thamnograptus. Dr. Ruedemann very graciously named it Thamnograptus poori. For one whose interest has been largely in minerals and rocks as such, and who has used fossils merely as a means to an end rather than an object of study in themseves, this honor has been a source of a great number of interesting comments.

The mode of living of the graptolites was such that one should not expect to find many perfect specimens of the organisms preserved in rocks. Their remains consist of the flattened stems, called the rhabdosome, along the side of which are small saw tooth-like projections known as hydrothecae, which were the small apartments, so to speak, in which the living organisms, or polyps, lived. Many rhabdosomes were attached to a bladder-like object filled with air or other gases, known as a pneumatocyst. This device served as a buoy floating on the surface of the still portion of the sea water. Upon death or when the rods were detached from the buoying device they fell to the floor of the sea and were covered with mud. Decay of the soft parts and pressure of the overlying sediments caused most of the material to be lost and the fossil remains consist of the insoluble carbonaceous portion of the original organism. Evidently great masses of these organisms formed a kind of plankton which collected over the surface of the quiet moving waters in the Ordovician seas of Alabama, and other places where they are common, in a manner not greatly unlike that of the Sargassun plants and animals of our present Sargasso Sea.

GNOMES AND KOBOLDS—(Continued from Page 34)

ious environment on the credulous and imaginative miner of old. In closing, it is interesting to note that the gnomes and knockers were so clearly a reflection of the good straightforward personality of the miners themselves in their knowledge of good and evil, their appreciation of industry, sincerity, and humility, and abhorence of the opposite traits.

1933-1934

March Bulletin — First Year Program

Mineralogy Club Movement for the Youths of the Secondary Schools of America

We feel that we cannot urge too strongly upon Club Sponsors the desirability of impressing upon their individual members, at every opportunity, the importance of building up their own personal reference collection of minerals. This need not be an expensive proposition, and as the individual's interest and knowledge in mineralogy grows he will find that such a collection will afford him many profitable hours of pleasant recreation. No one can ever hope to become a real student of mineralogy without easy access to a reference collection. No amount of text-book material can entirely take the place of actual minerals in hand, for the purpose of study and investigation.

Too much stress, likewise, cannot be placed upon the importance of the proper arrangement of one's collection. Careful, systematic organization of the material is often the principal difference between just a hodge podge bunch of rock, and a valuable collection of minerals. Many people are excellent accumulators of mineral specimens, and they will travel far, and go to almost any amount of expense to obtain choice material, after the securing of which they apparently lose all further interest in the individual specimens, allowing them to lay around for years in boxes, bags and unopened packages, always postponing to some future date the time when they will properly care for their mineral treasures. It would seem as though their enthusiasm only carries them half way. This trait, we believe, is largely a matter of habit, or is due to lack of proper early training in mineralogy. Perhaps, the manner in which they got their initial start accounts for their continual procrastination. Every sponsor, therefore, owes it to his charges, to see that each mineral is properly cared for at the earliest possible moment after its acquisition.

Organizing and arranging any considerable collection of minerals is no small task, and upon the many phases of this work a large volume might readily be written. In general the work of organizing a collection falls under two heads. (1) Identification, accessioning and cataloging; and, (2) housing and labeling. Each of these items affords a distinct problem for the individual to work out, according to the plan which best suits his own needs. Many perplexing questions will be encountered, especially by the beginner, and he will need the frequent advice of the Sponsor, or some experienced collector. The objectives of each individual must first be determined, and then he should carefully work out his plans for attaining these ends. The type of collection one should attempt will depend upon many things; such as, the use to which he expects it to be put; the region in which one lives and the nature of the material which is available locally; and the amount of money which one may spare to put into the collection for the purchase or exchange of mineral specimens, for the purchase of books, and for housing the collection.

Many types of collections are possible, and one may go in for a general or, perhaps, some special collection of minerals, for example; (1), ores and economic minerals; (2), a collection of gem material; (3), micro-mount specimens; (4), crystal forms; (5), museum and showy material; (6), petrological specimens; or (7) a "reference" collection of minerals. For the beginner or amateur collector, nothing so recommends itself for its educational or cultural value as a general or "reference" collection. Some go so far as to say that all beginners should start their studies with this type of a collection, and then decide

upon their specialty later as they become more advanced collectors, and their knowledge of the subject increases.

The primary object of this sort of a collection is not to gather only the most beautiful specimens, but rather as great a number of typical minerals as possible. These specimens should not be too large, individually, as the matter of housing soon becomes an acute problem in itself. About 1" x 2" on the average should be the size of the mineral most sought after. Each piece should be typical and of the best material obtainable at the time. When better specimens from the same locality can be obtained, these should be substituted, and the older, poorer material should be discarded, in favor of the better specimens, or passed on to others who do not have the mineral in their collection. Not only should one strive to obtain as large a number of minerals and varieties as is possible, but he should, likewise, work to obtain a number of specimens of most minerals from as many different localities and regions as is possible. The matter of the geographic distribution of a mineral is an important factor and should not be overlooked.

These are all subjects which every good Sponsor should have constantly in mind, and which he should discuss before his club whenever occasion presents. Individual attention and encouragement should be given each member, and he should be urged to launch out upon a collection of his own at the earliest possible moment. Next month we shall discuss briefly the subject of the proper organization and housing of one's collection, and in the meantime if any should desire mimeographed directions for constructing individual pasteboard trays for containing minerals in drawers, they will be sent free upon request, to National Club Sponsors or to others upon receipt of postage, by the National Director, Program Building and Research. (Ben Hur Wilson. 112 Mississippi Avenue, Joliet, Illinois).

Program Outline: Continued from the February Issue
The Thirteenth Club Meeting
Local Program: Visit to Mineral Collection

As planned at the twelfth meeting of the Club, the purpose of this meeting should be to visit the most outstanding collection of minerals which is within reach of the Club. Such a collection is usually available locally, or within easy driving distance. It may be found sometimes in a public museum, library, or in the geology department of some near by university or college; or, perhaps, in the possession of some advanced collector. A collection need not be very large to occupy the attention of an observing individual for the entire evening, and often a few drawers of choice minerals will serve the purpose of this meeting as well as a larger collection.

The special object of the visit should be to learn the best way in which minerals may be kept, and to build up ideas for developing one's own collection. Notes should be made, and particular attention should be given to the matter of accessioning and labeling the individual specimens. Observations on the best size and depth of the drawers, the size of the trays, and the order and methods of arrangement in the drawers are also pertinent. Are the minerals accessioned and cataloged in bound or loose leaf books, or on cards? If on cards are they cross indexed, and just what information is shown in the books or on the cards? All in all this meeting, in the long run, should be one of the most beneficial yet held by the club, for keen eyes and proper observation should steer the new beginner clear of many pitfalls, and mistakes, in the end saving him much valuable time and worry.

The Fourteenth Club Meeting
National Program: Business Meeting and Study Hour
Program Part I. Business Meeting

The regular order of business as provided by the By-laws should be carried out during this part of the meeting. A brief discussion or review of the observations made on the occasion of the last meeting of the Club would be in order, for it is true, that, even while viewing the same thing at the same time, scarcely any two individuals ever see everything exactly alike, much less everything that there is to be seen. Quite likely some have made observations upon one thing or phase of the work, while others were interested in something else, different, though perhaps equally important. This discussion, therefore, will tend to correlate and round out the ideas gleaned by

the various members, as well as to inform those who were unable to attend. Some plans should also be made for the Fifteenth Club meeting, which should be a "work hour," during which the time may profitably be spent in learning to make trays and labels for the minerals, and the proper method of giving them permanent identification. Committees should be appointed to ascertain the nature of and to secure the necessary materials for the work which is proposed to be done during the evening.

Part II. The Study Hour

Program Basis: The Metamorphic Rocks

1. Remarks by the Sponsor. A brief review of the talks that were given at the Tenth and Twelfth Club meetings, upon the origin and classification of the igneous and the sedimentary rocks, will be helpful at this time, as preparatory to the work of the evening. This will freshen the memory of the members who were present, and will also be especially desirable for those who were absent from these meetings.

2. Reading of "Articles of Interest to Mineralogists." Topic: Select certain sections discussing "Metamorphism," from some good elementary geology text-book, which may be read in from about eight to twelve minutes.

3. Reading of "Paper Prepared by Member." Subject: "Coal as a Metamorphic Mineral." (Award Paper. National Unified Program Topic).

4. Demonstration by Sponsor or visitor. Aim, an understanding of the Origin and Classification of the Metamorphic Rocks, and the importance of their place in Mineralogy.

5. Discussion of points brought out in the Program, and the answering of Question Box Queries.

6. Adjournment.

Program to be continued in the April issue.

The Amateur Lapidary

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones.* A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

THE DIAMOND SAW

The kindness of Mr. N. M. Felker of the Felker Research Laboratory of Torrance, Calif. makes it possible for us to give these very specific directions for the making and the use of the diamond saw. Mr. Felker wrote for us a very detailed description which for lack of space must be condensed but we have tried to touch on all the essentials.

The disc should be of spring brush copper. For a 10" disc use 22 gauge, for smaller discs use 24 gauge. The collars on the spindle should be as large as possible to still permit the saw to reach through the largest stone you will want to cut.

Buy diamond dust already crushed and graded. Use No. 0 as sold by Arthur A. Crafts Co., Boston, Mass.

About ¼ carat should charge a 10" saw. On your first attempts you may waste some and use more than above stated. When recharging the saw after it has become dull lesser amounts should be used. The 10" saw should run about 800 rpm. Smaller ones at greater speeds. Under no condition should it run fast enough to become heated as this will certainly cause warping.

Use coal oil (kerosene) as lubricant. At least when you are beginning run the disc with its lower edge immersed ¼" in a reservoir of coal oil. A sponge may be so placed as to prevent excessive throwing of the oil. Later a drip system of oiling may be used or a sponge feed.

The length of life of the saw on a single charge depends 99 per cent on the technique of the operator. (Assuming that the saw has been properly charged). If only homogeneous compact materials without cracks are sawed, and if the saw is entered only on flat smooth surfaces, and if excessive pressure is not used, and if speed is about correct, and if correct lubrication is maintained, the saw should cut 50 to 150 square inches on one charge. If it is sawed into a stone with cracks in it or if it is started on a sharp edge of stone, the charge may all be lost on a single cut or even before the cut is well started.

If the saw is kept well charged and the spindle and the workbench are free from vibration, there will be very little trouble from flat spots but if the charge is lost from a section of the saw a flat will develop rapidly. When a flat does develop the saw must be retrued and recharged. It may be recharged over the old charge only in case there are no flats and no excessive warping.

To charge a saw use a knife with a thin edge and tapping it lightly with a small hammer, make a series of cuts 1 mm. deep and 1 mm. apart across the edge of the disc all the way around. Mix the diamond dust with olive oil. With a match stick apply the mixture evenly over the entire edge of the saw. With a very light hammer tap the entire edge of the saw until most of the dust is imbedded in the metal. Rub off the surplus from the sides of the disc and put it aside to fill in bright places later. Place a smooth surfaced piece of agate in the rock holding device and let it ride on the edge of the disc as the disc is rocked back and forth by hand. Keep scraping the surplus off the sides and applying it on the edge especially on the bright spots. Keep up this rubbing until the entire edge becomes white. This may take up to an hour. The charging is then complete.

The spindle on which the saw is used must be true and positively have no lost motion and the whole machine must be free of vibration.

In starting the saw let it come up to speed before the stone is allowed to touch it.

Present a smooth flat surface of the stone to the saw, never a sharp edge nor a rough spot.

Use very light pressure and lessen this pressure as the saw nears the end of the cut. Never let the stone fall against the saw.

For small work it is alright to feed by hand. Have a solid rest for the stone and the hands and be careful to so hold the stone that no sharp edges will be presented to the saw.

If binding occurs it may be caused by:

1. Holding apparatus not being aligned with the saw.
2. Rock turning or twisting in the holding apparatus.
3. Too much pressure at beginning of cut.
4. Meeting a soft spot in the stone and going through it so fast that the saw is either deflected or fails to cut its path full width.
5. Small chips of stone or other foreign matter wedging between saw and side of cut.

If you have by now gotten the idea that this saw is a delicate instrument and will remember to treat it as such, your troubles will be greatly lessened.

Interesting selenite crystals, many of which are phosphorescent, have recently been found in the clay pits at Hudson, N.Y., by Carl H. Klein of that city.

Our Junior Club

Conducted by ILSIEN NATHALIE GAYLORD

Dear Juniors:

Spring again, and a whole long summer ahead for collecting specimens. Good hunting to you all!

There are so many of us now to go hunting for specimens, for new members have been pouring into the Club all the month. Such a hearty, friendly new member, eleven years old, writes us from his Canadian home in far-away Vancouver,

Dear Friends:

You have no idea how pleased we are that you have a Club to which we may belong. I wish I could know every member personally . . . Ever since I can remember I have been interested in stones. My little brother six years old has the same habit of filling his pockets with stones. We have a good collection of named specimens and many not labelled yet.

Wishing every member of the Club success, we are your Canadian Pals in everything you do.

PAT and EGAN O'LANE

Another letter from William McKinley, an older Junior from Illinois, sends the happy message that he has obtained the 1001st specimen for his collection. It has not been easy work getting those one thousand and one specimens because, as he writes:

"Illinois is flat and prairie-like in my locality. Gravel pits, creeks and farm lands are the only places of interest to a collector here. It is in such places I have had to seek, if I cared to study Geology at all."

Yet with so small an opportunity he has at last reached the splendid number of one thousand and one specimens. So others of our Club members who feel they, too, have a poor field for finding specimens can take courage from Mr. McKinley's experience. Next month we are to hear more of how he found specimens in such a seemingly barren collecting area.

Last month, you remember, Mr. Erdmann of Danville, Illinois, sent a generous gift to our Prize box of some beautiful geodes and fossils from his own fine collection. He must have set the ball rolling, for this month Mr. P. L. Forbes, of Stauffer, Oregon, has also sent us a splendid gift of volcanic "floating stones," and some beautiful iridescent obsidian of which he is the discoverer. In certain lights this obsidian—volcanic glass—shines with exquisite peacock green and purple tints. Most gratefully we thank Mr. Forbes for his beautiful and generous gift to our box of Prizes.

Now with greetings to new Club members, we will begin our Club lesson.

Finger-printing The Minerals

Nature has her own way of finger-printing her minerals, and for our Club lesson today this little pile of specimens will show us how she does it. Here is a piece of bright yellow sulphur. We will scratch it on this piece of rough unglazed china. There! It has left a yellow streak, a line of powdered sulphur scratched off by the rough china. That is sulphur's finger-print, its mark by which we can recognize pure sulphur.

This hematite—red iron ore—leaves a red streak. But here is a surprise! This bright blue chrysocolla leaves a white streak, and so does this red garnet, and this bit of green talc. Now let us try this specimen of silver, so black with tarnish we can scercely recognize it. Yet, look! It still gives its silvery streak. And this black hematite, not red like the other specimen, also gives its natural red streak.

All this shows us that whatever color a mineral may be, it has its own peculiar streak, a sort of finger-print which does not change. Regardless of whether the mineral for any reason alters its appearance disguisingly from red or silver or whatever its natural color, to black or some other shade, if it still keeps its original composition its streak like a betraying finger-print will quickly reveal its real identity.

That is why the color streak of minerals is such a help to us in identifying the new specimens we find. So until the next Club meeting suppose we experiment with the color streaks of all the specimens we can find.

Arranging Your Collection

There are so many good ways of arranging the specimens in a collection, it is hard to choose between them. For a new collector the following makes a fine start. Begin with a piece of granite, the most important rock to man. Then group around it specimens of the principal minerals of which it is made. They are quartz, feldspar, mica, and hornblende.

For the next group place around a piece of clear quartz or crystal group, specimens of different kinds of quartz, such as rose quartz, amethyst, smoky and milky quartz, carnelian, jasper, flint, and the lovely green chrysoprase. After that a specimen of feldspar could have its relatives beside it, and the same with mica and hornblende.

Then marble might come next, with limestone, coquina, and calcite beside it. With a calcite specimen could be samples of the lovely salmon, and blue, and golden calcites, together with the strange Iceland Spar, and many other calcite forms. One's collection would be exceedingly beautiful and fascinating, arranged in this way. Incidentally, many of these specimens are in our Prize box awaiting the happy winners in our Question Box contests each month.

The Weather Stone

Most accommodating, indeed, is one of the lithia minerals. It is lepidolite, and it is quite ready at any time to tell us what the weather will be, rainy or fair. Lepidolite is usually a pale grey-blue color. At least, on fair days it is. But let a rainy period threaten, and if our weather stone is beside an open window it will turn to a pink lilac shade. Then back it changes again to grey-blue when the air has cleared once more.

How Cold Are We?

While we are talking about weather stones, suppose we talk about a weather mineral too. That is mercury, the metal that tells us how hot or cold we are. We all know that it is in the bulb of our thermometers. But have you seen it out of the bulb?

It is a beautiful silvery-white metal, rolling in a shining liquid ball this way and that at the least jar, and splashing in an hundred round shining drops when it falls. Quicksilver it is called, because of its quick motion and silver color. How it surprises us as we lift it, for it is thirteen times heavier than water.

Then it has another surprise when it falls. Each drop however tiny, instead of sinking into the wood or whatever it lands upon, as water and other iquids do, still stays in a little round ball which you can easily pick up again, as perfect as ever. Another of its queer habits is that it stays liquid at ordinary temperatures. Water is the only other mineral which does that.

Not often, however, is liquid mercury found in nature. Usually it has combined with cinnabar. When one or more metals has combined like this in a rock mass, the rock is called an ore. So cinnabar is the ore of mercury. Occasionally a drop or two of liquid mercury is found on a piece of cinnabar. But usually the ore has to be put through a certain process including heat, to separate the mercury from it.

Cinnabar is a lovely scarlet shade of red, and makes a beautiful specimen for your collection. A bottle of mercury beside it is a fine exhibit of an ore and the metal that comes from it. Many metals are found in different ores, and they make a wonderfully interesting study.

But in handling mercury be sure you do not wear a gold ring or other jewelry on your hands. Mercury is very friendly with other minerals besides cinnabar, and gold is one of its esperial favorites. It readily combines with it, so be careful of your jewelry.

An Experiment—A Weather Prophet

With some blue cobalt chloride crystals you can easily make a weather prophet for yourself, that will tell you plainly when it will be rainy or fair. The crystals can be purchased at any chemist's supply company, or possibly at a drug store.

Put the cobalt chloride crystals into a glass dish of water until the water will not dissolve any more of the crystals. Then dip into the water a white

cloth or felt pennant, and put it beside an open window. If it threatens rain the pennant will turn pink. But when the weather is completely clear again the little flag will be blue.

Girls make pretty weather prophets with French dolls, by dipping the doll's white dress or coat in the cobalt chloride solution, and placing the doll on the sill of an open window. From blue to pink, and back again to blue the clothes will change with fair weather or storm. Soon in one of our Club lessons we are to learn all about cobalt and its lovely pink "bloom," as it is called.

The Question Box

1. Mercury freezes at about 40° below zero F. In polar regions the temperature goes far below forty degrees. So of course mercury is of no use to Admiral Byrd on his polar trips. What does he have in his thermometers to tell him how cold it is?

2. Why does mercury go up in the thermometer glass when it is hot, and down when the air becomes cold?

3. What mineral in crystallized form used on our dining tables and in the building of our homes, always feels cool when we touch it?

4. We have all seen what happens to the air bubbles in water when it boils. Quantities of the quartz crystals in granite contain very tiny bubbles of water, or other chemicals. What happens to these bubbles, and what do they do to the granite when it happens to be in the intense heat of a great fire?

5. What do these bubbles do to granite in severe freezing weather?

6. Because of the way granite acts in freezing weather, which do you think would last longer, polished or rough granite, for outdoor monuments and building stones?

Send your answers by April 15th, to Our Junior Club, Rocks and Minerals, Peekskill, N. Y.

Prizes

A first class prize will be given for the correct answers to all the questions.

A second class prize will be given for the correct answers to any four of the questions.

A third class prize will be given for the correct answers to any three of the answers.

The December prize winners were awarded with some exceedingly beautiful and interesting prizes. The first class prize winners were Doris Moore, of New York, who won a quartz and chalcedony geode. Eleanor Courtright, Illinois, whose prize was some Amazonstone. Beatrice Labes, Massachusetts, a staurolite—"cross" stones, which are twin crystals that have grown straight through each other. David Wheeler, Vermont, a floating stone . George Montgomery, Missouri, a geode. Emma Smith, Massachusetts, a chrysocolla specimen. Ruth Styer, New York, rose quartz. Paul Zimmer, Ohio, a fluorescent specimen. Margaret Dudziak, New York, a floating stone. Edward Styer, New York, Indian ochre. Dorothy Winlock, Massachusetts, obsidian (from a volcano). SECOND CLASS prizes went to Janette Graves, Massachusetts, a chrysocolla specimen. Ann Wrightington, Massachusetts, a floating stone.

Club and Society Notes

New Haven Mineral Club

Thirty-five members of the New Haven Mineral Club met January 15th at the club house in East Rock Park to listen to a talk on tools used by mineralogists interestingly delivered by Fred S. Eaton, Secretary of the Club and head of the City's Department of Trees. Another talk, illustrated by colored slides of minerals, was given by Frank Wilson. Many members brought along specimens which were passed around at the meeting and discussed.

The regular prospecting trips of the Mineral Club will be held during the period from May 1st to October and

the members invite those interested to join not only these trips but to attend the regular meetings which are held on the third Monday of each month at 8:00 P. M. at the East Rock Park Club House. Many who know little of mineralogy have become members with the idea of perfecting themselves in knowledge and to acquire a new diversion or hobby. There are some associate and corresponding members also connected with this club.

Anyone interested in joining this organization please communicate with William H. Otersen, 16 Grove Place, West Haven, Connecticut or Frank Wilson, Pratts Corners, West Cheshire, Connecticut. There are plans on the program for the New Haven Mineral Club to join the National Outing held by Rocks and Minerals Association which will prove interesting to everyone.

Mineralogical Society of Southern California

The 26th meeting of the Mineralogical Society of Southern California was held in Pasadena Dec. 11. Dr. R. H. Swift of Beverly Hills spoke on "The Sacred Beetles of Egypt." He displayed in a glass case beetle scarabs carved out of amber, jade, quartz, lapis lazuli, malachite, jaspers, and many other kinds of gems and stones.

The speaker at the January meeting was Prof. Ian Campbell of the California Institute of Technology. He spoke on "Salt Domes and Salt Mines" and showed their geologic history, structure, and commercial importance together with the associated minerals, mainly oil and sulphur.

Fluorescence of minerals was explained and demonstrated by K. N. Reed, a member of the Society who has been working in this field for a long time. Other members of the Society are taking up this most fascinating department of collecting and experimenting.

WENDELL O. STEWART.

Philadelphia Mineralogical Society

President Gillson called to order a stated meeting of the Philadelphia Mineralogicel Society, with 54 persons present. Dr. L. C. Wills, as President, announced the formation of the Philadelphia Microscopic Society, and invited all the members to attend the first meeting on the Third Thursday of the month in the meeting room of the Mineralogical Society.

Dr. Edgar T. Wherry announced the recent death of Dr. Henry S. Washington the very eminent Mineralogist, relating personal anecdotes about him. He also announced the recent death of T. Chalkley Palmer of Media, Pa., who was very active in the Delaware County Institute of Science.

President Gillson appointed Mr. H. E. MacNelly and Mr. M. G. Biernbaum to conduct the balloting on the Amendment to Article II Section 3 of the By-laws, which was defeated.

Mr. Toothaker exhibited lantern slides of unusual twinning of Calcite Crystals from Guanajuato, Mexico.

Mr. Teubner explained how he constructed a camera attachment with telescopic lenses to magnify from 15 to 40 times, for the purpose of making photo-micrographs of microscopic specimens.

President Gillson introduced the speaker of the Evening, Professor J. E. Shrader of Drexel Institute, Philadelphia, whose subject was "Polarized Light." Prof. Shrader very clearly explained what polarized light was, describing in non-technical language the three methods of obtaining Polarized Light. Special projection apparatus for demonstrating and illustrating his talk, was employed by Prof. Shrader.

President Gillson followed this talk with a non-technical presentation of the "Use of Polarized Light and the Petrographic Microscope in Mineral Identification." Any microscope can be used, together with index liquids in determining the medium indices of refraction. A set of index liquids can be prepared at a very slight expense. At the same time a lot of other properties of a mineral may be determined also, which would go a long way toward the identification of the mineral. A demonstration was conducted at the conclusion of the meeting.

Mr. H. E. MacNelly exhibited his microscope, which he constructed at a very moderate cost, explaining its construction and demonstrating what could be done with it.

W. H. FLACK, Secretary.

READERS' SECTION

Suggestion Adopted!

Editor "R & M.":

The following suggestion may or may not appeal to you as valid. Why not devote an entire page of each issue to correspondence? This could be expanded to two pages whenever necessary. With such a page definitely established as a part of each issue, readers would commence to write in suggestions, criticisms, rebuttals of criticisms, etc., much in the manner of submitting articles for publication. I do not think this feature would suffer for lack of material—and cogent material; to my mind the greatest problem would be the editing of the material. A great many letters sent in would probably be valueless so far as publication was concerned, for there would be some who would write in with nothing to say, just with the idea of seeing their words in print. I don't think anything should be used unless it were constructive, either on the side of suggestion or criticism, and letters praising the journal would be completely out of place. If there were a possibility of the page lacking sufficient material—worth while material, I mean—the page might be called 'Editorials and Correspondence' to include brief opinions in the form of essays and the treatment of various subjects relating to mineralogy and mineralogists. This would also give an opportunity to those who wish to voice ideas anonymously. I believe that such a page is an absolute necessity for any organization that is comparatively new, for such organizations can be built forward beyond the stage of experiment only through the assimilation of the various ideas and constructively-critical opinions of those who make up the organization and are willing to take enough interest to aid in its progress. I think this lack of interest is the greatest danger which threatens the existence of any class publication.

You deserve only whole-hearted praise for the part you have played in creating and admirably managing "Rocks and Minerals." It will continue successfully by the interest of its readers. They may as well awake from their sound sleep of passive reception (and I include myself here as guilty) and try to make their apparently enthusiastic interest mean something besides merely reading the magazine. "Rocks and Minerals" must become a definitely-established thing with a definite task to accomplish. It must serve the greatest number of readers in the best possible way, and the readers owe just as much to it in the way of active participation and help.

New York, N. Y.

ARTHUR MONTGOMERY

P. S.—Let me add that your February issue seems to me a very meritorious accomplishment in itself. I should think the type of article, "Mount Apatite, Maine," would prove of greater appeal and interest to your readers than any other.

Thanks For The Compliment

Editor "R. & M.":

The February issue arrived today and is—at least to my way of thinking—a great improvement over the January number. This is because I can really appreciate an article like the one on Mount Apatite. My compliments to the authors of this article—it is a well-done piece of work. The article descriptive of Phoenixville is also very interesting, commendable, and of lasting value to collectors. This is the sort of thing we should have more of. More power to you and the magazine, and my compliments to a darn hardworking and deserving Editor.

Galesburg, Ill.

E. MITCHELL GUNNELL

It Gave Us a Thrill Too

Editor "R. & M.":

It gave us all a thrill of pleasure to see Rocks and Minerals come out monthly. It is a personal regret that we could not help more to bring this about, but is it out of place to say "thank you" to the Editor for his untiring efforts to make the pleasure and profit available to us twelve times a year! May the magazine prosper and continue to be as interesting as it always has been. Each new department has widened its interest, it is true, but it always was good.

Swiftwater, Penn.

ESTHER L. FISHER